INTERNATIONAL STANDARD

ISO/IEC 14496-4

Second edition
2004-12-15

AMENDMENT 19
2007-12-01

Information technology — Coding of audio-visual objects —

Part 4: Conformance testing

AMENDMENT 19: Audio lossless coding (ALS)

Technologies de l'information — Codage des objets audiovisuels —

Partie 4: Essai de conformité

AMENDEMENT 19: Codage audio sans perte (ALS)

Reference number
ISO/IEC 14496-4:2004/Amd.19:2007(E)

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The main task of the joint technical committee is to prepare International Standards. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

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Amendment 19 to ISO/IEC 14496-4:2004 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 29, *Coding of audio, picture, multimedia and hypermedia information*.

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Information technology — Coding of audio-visual objects —

Part 4:
Conformance testing

AMENDMENT 19: Audio lossless coding (ALS)

In subclause 6.5.1 File name conventions, add the following row at the end of Table 29:

Table 29 – File name conventions

ALS	als_<tool>_<coreSetup>	als_<tool>_<coreSetup>

At the end of subclause 6.6 Audio Object Types, add the following subclauses:

6.6.22 ALS (Audio lossless coding)

6.6.22.1 Compressed data

6.6.22.1.1 Characteristics

Conformant ALS compressed MPEG-4 data shall have the ALS data stored as outlined in ISO/IEC 14496-3.

6.6.22.1.2 Test procedure

Each compressed data shall meet the syntactic and semantic requirements specified in ISO/IEC 14496-3. The decoded data shall also meet the requirements defined in ISO/IEC 14496-3. If a syntactic element is not listed below, no restrictions apply to that element. The **reserved** element shall be encoded with the value zero.

6.6.22.1.2.1 Compressed MPEG-4 data payload

6.6.22.1.2.1.1 AudioSpecificConfig

audioObjectType: Shall be encoded with the value 36.

samplingFrequencyIndex: Shall be encoded with the value 0xf.

SamplingFrequency: Shall be encoded with the value samp_freq if samp_freq < 2^{24}, and with the value 0 otherwise, with samp_freq as defined in ISO/IEC 14496-3.

channelConfiguration: Shall be encoded with the value 0.

6.6.22.1.2.1.2 ALSSpecificConfig

als_id: Shall be encoded with the value 1095521024 (0x414C5300 hex).

file_type: Shall be encoded with a value in the range [0 3]. Other values are reserved.

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resolution: Shall be encoded with a value in the range [0 3]. Other values are reserved.

frame_length: Shall be encoded with a value that is divisible by 2^{levels} without remainder, with levels as defined in ISO/IEC 14496-3.

ra_flag: Shall be encoded with a value in the range [0 2]. The value 3 is reserved.

6.6.22.1.2.1.3 block_data

opt_order: Shall be encoded with a value in the range [0 Kmax], where Kmax = $2^{Bits} - 1$, with

$$Bits = \min\{ceil[\log2(max_order+1)], max[ceil(\log2((N_B>>3)-1)), 1]\}$$

as defined in ISO/IEC 14496-3.

6.6.22.2 Decoders

6.6.22.2.1 Characteristics

The object type ALS has the Object Type ID 36, and the compressed MPEG-4 data syntax is defined in ISO/IEC 14496-3. The Audio Object Type ALS contains the ALS tools.

6.6.22.2.2 ALS conformance test procedure

Compressed data and reference decoder output signals are provided to apply the conformance criterion using the procedure described in the following subclause.

The conformance of the ALS decoder can be checked with compressed data for the ALS object type.

For lossless compressed data the conformance criterion is bit exact reproduction of the reference decoder output, this means that all bits in the output of the test decoder are identical to the corresponding bits in the output of the reference decoder.

To be called a conforming ALS decoder, the required conformance criterion must be met for all compressed data listed in subclause 6.6.22.2.3.

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6.6.22.2.3 Proposed test sequences

Table AMD19-1 — ALS test sequences

file base name	content	Number of Channels	sampling frequency (kHz)	word length (bit)	adaptive order	random access	block switching	LTP	joint stereo	MCC	BGMC	RLSLMS	Conformance criteria
als_00	music	2	48, 96,192	16, 20, 24	y	y							Bit exact
als_01	music	2	48, 96,192	16, 20, 24	y		y		y				Bit exact
als_02	music	2	48, 96,192	16, 20, 24				y					Bit exact
als_03	music	2	48, 96,192	16, 20, 24					y				Bit exact
als_04	music	2	48, 96,192	16, 20, 24						y			Bit exact
als_05	music	2	48, 96,192	16, 20, 24							y		Bit exact
als_06	music	2	48, 96,192	16, 20, 24								y	Bit exact
als_07	music	2	192	32 float	y								Bit exact
als_08	music	6	96	24	y	y	y	y	y	y	y		Bit exact
als_09	bio data	512	2	16	y		y	y	y	y	y		Bit exact

6.6.22.3 Encoders

In order to guarantee for an encoder implementation that the decoded output results in an exact replica of the input signal, the following procedure should be followed:

- Generate bitstreams using the target encoder for the conformance test item reference waveform data;

- Decode these bitstreams using the conformant reference software decoder;

- Verify that the decoded outputs are identical to the inputs.

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